FLYING PING PONG BALL

Believe it or not, the secret to this mystery of levitation is right in front of your nose. All you'll need is a hairdryer and a ping pong ball to experience the power of air.

###### **MATERIALS**

* Hair dryer
* Empty toilet paper tube
* Ping-pong ball
* Balloon
* Beach ball

###### **EXPERIMENT**

1. Set the hair dryer to cool, switch it on, and point it at the ceiling.
2. Carefully put the ping-pong ball in the stream of air. Hold the hair dryer very steady and watch as the ping-pong ball floats in the stream of air.
3. Carefully move the hair dryer from left to right and watch how the ball moves as well, staying in the stream of air.
4. Try floating other lightweight objects in the air stream at the same time! With the hair dryer on, place an inflated balloon over your levitating ping-pong ball. You might want to place a penny in the balloon before you blow it up to give it some added weight.
5. Try to float two or more balls in the same air stream. How many can you float at once? How do they behave when there is more than one?
6. And for the finale... balance a ping-pong ball in the air stream. Then place your empty toilet paper tube above it in the air. Watch it float above the ball. Then watch the ball get sucked up inside the toilet paper tube! Always conclude this demo with a thanks to Bernoulli.

###### **HOW DOES IT WORK?**

The floating ping-pong ball is a wonderful example of Bernoulli's Principle, the same principle that allows heavier-than-air objects like airplanes to fly.

Bernoulli, an 18th century Swiss mathematician, discovered something quite unusual about moving air. He found that the faster air flows over the surface of something, the less the air pushes on that surface (and so the lower its pressure).

The air from the hair dryer flows around the outside of the ball and, if you position the ball carefully, the air flows evenly around each side. Gravity pulls the ball downwards while the pressure below the ball from the moving air forces it upwards. This means that all the forces acting on the ball are balanced and the ball hovers in mid-air.

As you move the hair dryer you can make the ball follow the stream of air because Bernoulli's Principle says that the fast moving air around the sides of the ball is at a lower pressure than the surrounding stationary air. If the ball tries to leave the stream of air, the still, higher pressure air will push it back in. So, the ball will float in the flow no matter how you move.

When you place the empty toilet paper tube into the air stream, the air is funneled into a smaller area, making air move even faster. The pressure in the tube becomes even lower than that of the air surrounding the ball, and the ball is pushed up into the tube.

Airplanes can fly because of Bernoulli's Principle. Air rushing over the top of airplane wings exerts less pressure than air from under the wings. So the relatively greater air pressure beneath the wings supplies the upward force, or lift, that enables airplanes to fly.